October 17, 2002

Mr. Craig D. MacDonald, Ph.D., Superintendent
Stellwagen Bank National Marine Sanctuary
175 Edward Foster Rd.
Scituate, MA 02066

Dear Craig:

We offer the following comments on Sanctuary management strategies and on what issues and problems we see as management priorities for the next 5-10 years. It seems sensible for us to comment now and then to continue to advise you and your staff through our role on the Advisory Council.

We were pleased to see that fishermen took the time to attend and to participate, especially in Gloucester and Provincetown - two fishing communities that have Stellwagen Bank at their front doors. You were a first-hand witness to the fear these fishermen have that a revised Sanctuary Plan will in some way further impact their ability to fish. Amendment 13 to the Multispecies FMP has every groundfish fisherman alarmed that they may not survive the new SFA-mandated late-2003 restrictions that could include far-reaching, year-round closures of critical, nearby fishing grounds on which they depend. DMF will oppose those closures and support other alternatives.

Amendment 13 has fisheries habitat considerations as well; therefore, the Sanctuary Plan scoping hearings came at a time when nerves were frayed and tempers were high. Mistrust was and still is widespread. Fisheries managers, and now Sanctuary managers, find ourselves at the center of fishermen's attention because more needs to be done to rebuild overfished stocks and protect fisheries habitat - two responsibilities of the New England Fishery Management Council that will look to the Sanctuary for information and recommendations. Some Amendment 13 options include more Sanctuary territory in the Western Gulf of Maine year-round closure, as recommended by the Habitat Committee. This is not lost on fishermen who feel more valuable fishing grounds will be lost to protect habitat they contend doesn't need protection, such as sand and other bottom incapable of sustaining widespread, high-profile 3-D seascape serving as possible shelter and food for juvenile groundfish.

We suggest the Sanctuary Plan must emphasize regaining trust and demonstrating that Sanctuary staff are very open-minded about how to deal with the issue of impact of fishing gear on the bottom habitat. This can be accomplished by working with fishermen on collaborative research projects designed to identify sensitive bottom habitat and investigate improved fishing gear to reduce or eliminate impact in those areas. From your recent trip with me on the F/V Blue Skies you saw how nets can be designed to allow valuable fisheries and markedly reduce net contact with the sea bed. DMF is committed to this sort of research with fishermen.

We suggest the Plan identify DMF, and fishermen, as your Sanctuary research partners with an emphasis on conservation engineering for improved habitat protection. DMF's Conservation Engineering Program is of high priority, and we have plans for significant expansion. With DMF intending to acquire more and better fishing gear-monitoring devices - like the innovative equipment you witnessed in operation - in partnership with the Sanctuary we can tackle common habitat conservation concerns.

Another way to build trust is to acknowledge in the Plan the dependence and economic importance of the Sanctuary to coastal fishing communities such as Provincetown. The Captain of the Blue Skies, Luis Ribas shared his plots of many tows he has made for groundfish and other species on Stellwagen Bank and nearby. Relatively small vessels such as his are very weather-dependent; therefore, Stellwagen is extremely important to Provincetown fishermen. The Sanctuary should convince the fishing industry that its views have at least as much weight as those wanting the Sanctuary, or a portion thereof, as a fishery or ecological reserve, or even a marine wilderness.

We emphasize that commercial fishermen should never be characterized as threats to the Sanctuary. They are part of a multiple-use approach that should involve them in research and monitoring in the best interests of improving fisheries, i.e., fishermen's own welfare, through improved habitat protection. Here's where more Sanctuary formal discussion with the New England Fishery Management Council should occur. The Council has an MPA Committee that could serve as the means for Sanctuary habitat issues to get more attention.

The Sanctuary will need many "eyes on the water," and these can be provided by fishermen (e.g., spotting whale entanglements and improper fishing gear). They can serve as Sanctuary sentinels. They know the Sanctuary and its sea bed. They know how fish move seasonally within and throughout the Sanctuary. They have shared concerns with the Sanctuary, e.g., water quality issues. Tap that knowledge, culture that relationship and confrontation will be far less likely. I may appear repetitive. I am because if I've learned nothing else during my many years as a DMF fisheries manager, I've learned that fishermen have a wealth of knowledge from years of first-hand experience and observations. They want to work with us provided we acknowledge their concerns and we try to accommodate them when and if we can.

On a related issue, we know effect of fishing gear on fisheries habitat is a new and controversial issue. It has emerged, and in a big way. DMF is paying very close attention to this issue. In fact, we have assembled some DMF draft policies on MPAs with mobile gear impact on habitat being addressed. One policy is that DMF does not classify bottom trawling and/or sea scallop dredging as destructive fishing techniques threatening Gulf of Maine marine biodiversity, although DMF does believe there are areas where trawling and sea scallop dredging are ill-advised, and other fishing gear or modified trawls/dredges should be used. Some of those areas might be within the Sanctuary, and we look to Sanctuary staff and research for insights into where those areas can be found.

This brings us to the question of whether the Sanctuary can accept impact of bottom trawling and sea scallop dredging as inevitable and acceptable consequences of catching valuable fish and shellfish and the economic value that catch produces for the Commonwealth's seafood industry. Are there areas in the Sanctuary where trawling and dredging must be considered unacceptable and, if so, where and why?

A related issue is whether any of the New England Council's Amendment 13 proposed alternatives to minimize impact of fishing on EFH satisfy the Sanctuary's concern about protection of bottom habitat. One option would result in what appears to be a closure of almost one-half the Sanctuary thereby including a "diversity of varied habitats." Sanctuary reaction to this Amendment 13 option will send a clear message to those participating in the on-going Sanctuary Management Plan Review about where the Sanctuary is heading. Will Sanctuary staff want an Amendment 13 focus on hard, complex bottom only or will all the area in the proposed westward extension be supported? How will the Sanctuary position on these options impact the success of the next steps in Management Plan review (e.g., Action Plan development)? Just some food for thought. Also, by supporting this option that opens a large portion of the Western Gulf of Maine Closed Area, the Sanctuary will support a return of fishing to those reopened habitats. Is this what the Sanctuary wants in adjacent federal waters? This is a bit of a tricky issue with Sanctuary policy implications. Give careful thought to this one.

It has been stated that an effect of trawling is removal of significant 3-D structure in some areas important for juvenile cod shelter and food. With great attention being paid to cod, we surmise that some will believe fishing restrictions for habitat protection in the Sanctuary will hasten rebuilding of the Gulf of Maine cod stock. Sanctuary staff already has made that case although after reviewing the research serving as a basis for this conclusion, we suggest the case is not as strong as claimed. For example, analytical assumptions about differential density-dependent mortality rates and differential movement rates among habitat types drove research results. Conclusions were preordained. Moreover, the design of experiments needed to calculate mortality rates was flawed because very limited aquarium space was extrapolated to the open ocean (age zero cod subjected to an age 3 cod predator at a length equal to 60% tank width and 30% of length). Even the authors acknowledged limitations of laboratory experiments for studies of wide-ranging predators. Please don't take these comments in a wrong way. They are important experimental findings that warrant further scrutiny.

Perhaps there will be some benefit to cod rebuilding, although very difficult to quantify because one needs to compare the potential for the Sanctuary to become an important cod nursery area versus other well-documented nursery areas in the Gulf of Maine. The issue is the location of young-of-the-year (age 0) and age 1 juvenile cod in the Gulf of Maine. In particular, where are these ages in relation to the Sanctuary? Is there a shortage of GOM habitat thereby placing more importance on the Sanctuary? DMF research can provide some insights.

According to our biologists who analyzed 22 years of juvenile cod data (ages 0 and 1) collected from eastern Massachusetts' territorial waters, depths less than 90 feet inside coastal headlands of major embayments (Ipswich Bay, Massachusetts Bay, and Cape Cod Bay) offer suitable habitat for successful recruitment. Age 0 cod are up to 15 cm in length. Shoaler areas less than 60 feet are more seasonally important for settlement than deeper strata and are preferred settlement depths. These biologists concluded: "A cod nursery is located off the eastern Massachusetts coastline and within state territorial waters jurisdiction." They also concluded that based on 1963-1997 data, age 0 cod are rarely caught in the NEFSC spring offshore survey including Stellwagen Bank. Autumn data showed similar results. All these findings are found in a DMF manuscript: "Spatial

distribution of ages 0 and 1 Atlantic cod (*Gadus morhua*) off eastern Massachusetts coast, 1978-1999, relative to 'Habitat Area of Particular Concern."

Based on these data and DMF's assessment of age 0 and 1 distribution, the New England Council concluded that the entire perimeter of the Gulf of Maine from mean low water to a depth of 30 feet below mean low water should be designated as "Habitat Areas of Particular Concern." Here is where the emphasis on habitat for increasing survival of ages 0 and 1 cod has been placed. For this reason the importance of the Sanctuary for age 0 and 1 improved survival through more habitat protection (i.e., bottom trawling prohibitions) is quite questionable. Providing more habitat in the Sanctuary may not have the desired effects. Habitat already is widespread throughout the Gulf of Maine where the nursery function is prevalent. See the attached figures depicting relative abundance (number per tow) of ages 0 and 1 cod from DMF spring and autumn inshore trawl surveys from 1978 through 1999.

If the Sanctuary Plan is to include areas requested of the Fishery Management Council for closures to trawling and scallop dredging to improve survival of ages 0 and 1 cod, the Plan must first make a compelling case as to how areas that historically have had low abundance of young stages of cod can be transformed to mimic very productive inshore areas. This is a major issue heretofore not considered.

This is an emerging Sanctuary resource management issue of great significance, and it is central to the issue of fishery or ecological reserves being considered for a portion of the Sanctuary. It's likely this suggestion was made as part of an ongoing initiative by environmental organizations to spotlight the Sanctuary as the archetype MPA to be part of their sought-after network of marine reserves in the Gulf of Maine. DMF supports establishing marine reserves only when there are very specific, unambiguous, attainable objectives and when there will be effective, timely monitoring to determine success of reaching reserve's objectives. Those objectives must be consistent with fisheries managers' plans to improve stock status and enhance habitat protection. Consequently, any consideration of a reserve(s) in the Sanctuary must be very carefully considered and well justified. Stakeholder involvement in MPA (i.e., reserve) identification and support for implementation are critical elements of a successful MPA.

Furthermore, any consideration should avoid use of a Sanctuary reserve as an element of precautionary fisheries management. While some reserve proponents will find this intent very attractive, fisheries managers will not. Building productive and cooperative relationships with New England Council and state fisheries managers is an important issue and should be a Sanctuary high priority.

Another emerging Sanctuary resource management issue is protection of biodiversity. Protecting marine biodiversity is a relatively recent objective, and it can be ambiguous. Because the Sanctuary places a high premium on this concept, the Sanctuary should better define the term especially as to how and to what extent habitat loss in the Sanctuary affects biodiversity. If biodiversity is reduced, what are the consequences? How is the efficacy of the Sanctuary affected? The impetus for protecting biodiversity is the accelerating rate of species disappearance (extinction) due to habitat loss, pollution, and introduction of exotic species. An issue is why this impetus pertains to activities within Sanctuary boundaries.

Requiring biodiversity protection is very defensible and required for many areas on land and for marine areas with coral reefs, sea grass meadows, mangrove swamps and

other fragile, unique ecosystems easily destroyed by human activities. But the Sanctuary is a dynamic oceanographic area with an ecosystem typical of temperate climes having a complex pattern of seasonal changes in productivity. The public and especially the fishing industry requires a good explanation about why the Sanctuary's biodiversity is special enough to warrant possible future closed areas to protect that biodiversity.

Another scoping issue is adequacy of Sanctuary boundaries and zones to protect Sanctuary resources. We see no reason to expand the boundaries or to change them in any way. The Sanctuary already poses a challenge for its administration, including research, monitoring, and enforcement. We suggest a continued focus on the Stellwagen Bank area and an avoidance of the likely conflict with the fishing industry that will occur if the Sanctuary's scope is widened to include areas such as Jeffrey's Ledge. First identify what needs to be done in the existing Sanctuary. Make a compelling case for those changes. Evaluate the consequences of those changes. If benefits prove to be significant, then consider a Sanctuary expansion based on results and not supposition.

Zoning is a concept applied by DMF in territorial waters of the Commonwealth. It involves a great deal of careful planning and justification and a major investment in at sea enforcement and monitoring. Some of our zoning efforts appear to have been successful but only with special efforts by enforcement to make it work. If the Sanctuary attempts to zone the Bank and nearby environs for whatever purpose, it must learn from our experience and temper its enthusiasm for the approach with a large dose of harsh reality. High priority issues such as protection of special locations (e.g., wreck of the Portland) should be the focus of zoning requiring enforcement and monitoring with already limited Sanctuary funds.

At the Provincetown public hearing you expressed your concern about sand eels in the Sanctuary. I believe you said that sand eel abundance was down, and that was a concern. Sand eels are important prey for marine mammals. Although we cannot comment on whether abundance is up or down, we can respond to your suggestion that trawling or scallop dredging in the Sanctuary might be having an impact on sand eel abundance due to impact on sand habitat. That was your implication, although perhaps I misunderstood your point.

We bring your attention to a recent paper published in Marine Ecology Progress Series entitled "Sand eel recruitment in the North Sea: demographic, climatic, and trophic levels" (August 2002, Vol. 238). These U.K. researchers concluded that climate change may impact upon sand eel populations in the North Sea. They speculated that the southern limit of the species' distribution could shift northward if conditions become warmer, and recruitment might become compromised by rising temperatures. They highlighted that the North Atlantic Oscillation has been in an extreme positive phase during the last half century, and the resultant climate forcing can have major effects on fish populations (perhaps on sand eels). Over the last few years, at least, we've witnessed warmer temperatures in Massachusetts Bay and a northward shift of more southern species (e.g., black sea bass) indicating some important change in sea temperatures.

Furthermore, abundance of other species may be having an important effect on sand eel abundance. As noted in Fishes of the Gulf of Maine (Bigelow and Schroeder 2002), "Western North Atlantic populations of sand launce increased dramatically in the early 1980s. This population explosion was correlated with a decline in herring and mackerel. Sand launce seemed to have replaced these stocks..." Currently we have

extremely large abundance of both herring and mackerel off our coast. If there is a relationship, sand eels may be suffering the consequences of this ecosystem shift in species dominance.

Furthermore, whiting are aggressive predators of sand eels that "do not hesitate to follow them up onto the sand, often stranding them in such numbers as to cover the flats" (Bigelow and Schroeder). Consider that the last assessment of whiting abundance revealed that "temperature patterns and trends in silver hake distribution support the view that there has been a shift in range from south to north, forced by environmental conditions." Biomass is high and is "likely near carrying capacity." This is quite a statement, and it has serious implications for sand eel abundance and Sanctuary denizens that depend on eels (marine mammals). A whiting fishery in or near the Sanctuary makes a great deal of sense especially when prosecuted with the sweepless trawl - the gear you witnessed in action on the Blue Skies.

Sand eels dart into and burrow in sand for temporary shelter. They escape into the water column when disturbed. There can be no adverse effects on sand eel abundance from trawling or scalloping in sandy areas or wherever else they reside. Abundance is affected by the environment and interactions with other species (predators and competitors).

In conclusion, DMF looks forward to working with you and your staff on action plans for the Sanctuary. Opposing points of view expressed at the public hearings will have to be debated and reconciled if possible. The next few months leading up to the Draft Management Plan for the summer 2003 should witness the clash of agendas of people and organizations wanting to seize this Sanctuary initiative as the vehicle to maximize habitat protection in the interest of precautionary habitat management, and even precautionary fisheries management.

We hope it doesn't come down to a win-lose situation for those people and organizations, DMF included, with Sanctuary staff being whipsawed by those competing for Sanctuary favor. There must be win-win situations. The Draft Management Plan must be rife with research agendas and strategies to answer important Sanctuary questions and with actions plans related to protection of well-defined, sensitive habitat. There also must be a blueprint for continued cooperation with and support from the fishing industry and state and Council fisheries managers who share many of the same concerns as the Sanctuary.

Sincerely yours,

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Deputy Director

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